

## 2-7/2-8: Fitting a Model to Data

**Warm-up:** The point with coordinates (10, 20) appears on the graph for each variation function below. Determine the value of  $k$  in each case, and then determine the value of  $y$  when  $x$  is 30.

a.  $y = kx$

b.  $y = \frac{k}{x}$

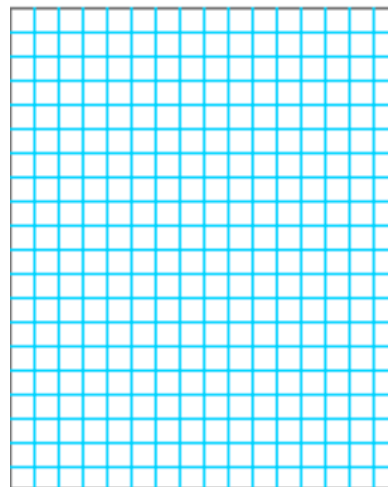
c.  $y = kx^2$

d.  $y = \frac{k}{x^2}$

*Mathematical Model:*

*Example 1:* Matt Mitarnowski and Fuzzy Jeff measured the intensity of light at various distances from a lamp and got the data where  $d$  = distance in meters and  $I$  = intensity in watts/m<sup>2</sup>.

$d$	$I$
2	560
2.5	360
3	250
3.5	185
4	140



*Steps to Finding a Model from Data:*

1.

2.

3.

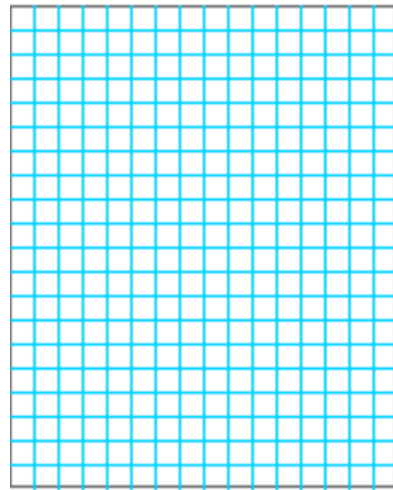
4.

5.

6.

*Example 2:* Matt Mitarnowski measured how far a marble rolled down a ramp over a period of time. He obtained the following data where  $t$  is time in seconds and  $D$  is distance in inches.

$t$	$D$
1	.6
2	2.4
3	5.2
4	9.8
5	15.2



*Converse of the Fundamental Theorem of Variation*

a.

b.

*Homework:*